SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

GOVERNING BOARD

Chair: WILLIAM A. BURKE, Ed.D.

Speaker of the Assembly Appointee

Vice Chair: S. ROY WILSON, Ed.D.

Supervisor, Fourth District

Riverside County Representative

MEMBERS:

MICHAEL D. ANTONOVICH

Supervisor, Fifth District

Los Angeles County Representative

BILL CAMPBELL

Supervisor, Third District

Orange County Representative

JANE W. CARNEY

Senate Rules Committee Appointee

RONALD O. LOVERIDGE

Mayor, City of Riverside

Cities Representative, Riverside County

GARY OVITT

Supervisor, Fourth District

San Bernardino County Representative

JAN PERRY

Councilmember, 9th District

Cities Representative, Los Angeles County, Western Region

MIGUEL PULIDO

Mayor, City of Santa Ana

Cities Representative, Orange County

TONIA REYES URANGA

Councilmember, City of Long Beach

Cities Representative, Los Angeles County, Eastern Region

VACANT

Governor's Appointee

DENNIS YATES

Mayor, City of Chino

Cities Representative, San Bernardino County

EXECUTIVE OFFICER

BARRY R. WALLERSTEIN, D.Env.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

DRAFT SOCIOECONOMIC REPORT FOR THE DRAFT FINAL 2007 AQMP

Elaine Chang, DrPH
Deputy Executive Officer
Planning, Rule Development and Area Sources

Laki T. Tisopulos, Ph.D., P.E Assisstant Deputy Executive Officer Planning, Rule Development and Area Sources

> Jill Whynot Planning & Rules Manager

AUTHORS

Sue Lieu, Ph.D. Shah Dabirian, Ph.D. Patricia Kwon Air Quality Specialist Air Quality Specialist

TECHNICAL ASSISTANCE

Bong Kim, Ph.D. Joe Cassmassi Randall Pasek, Ph.D. Planning & Rules Manager Air Quality Specialist Air Quality Specialist Dave Coel Kathy Hsaio Susan Yan Program Supervisor Program Supervisor Air Quality Specialist Xinqiu Zhang, Ph.D. Edward Eckerle Mark Bassett, Ph.D. **Program Supervisor** Air Quality Specialist Air Quality Specialist

CONSULTANTS

Leland Deck, Ph.D. Stephen Levy Professor Karen Polenske, MIT

Lauraine G. Chesnut
Stratus Consulting Inc.

Director, Center for Continuing
Study of the California Economy

Gang Shao, Ph.D. George Treyz, Ph.D.

Wilbur Smith Associates Regional Economic Model, Inc.

(REMI)

The Southern California Association of Governments provided valuable technical assistance relative to the cost and benefit of transportation projects and baseline economic forecasts.

TABLE OF CONTENTS

EXECUTIVE SUMMARY		ES-1
CHAPTER		
1	INTRODUCTION	
	INTRODUCTION	1-1
	INTRODUCTIONDRAFT FINAL 2007 AQMP	1-1
	LEGAL REQUIREMENTS	1-2
	Current Socioeconomic Analysis Program	1-2
	DRAFT 2007 AOMP SOCIOECONOMIC ISSUES	1-5
	ASSESSMENT METHODOLOGY	1-5
	Benefit Analysis	1-6
	Cost Analysis	1-8
	Job and Other Socioeconomic Impact Analysis	1-8
2	POPULATION AND ECONOMY OF THE FOUR-COUNTY REGION	
	INTRODUCTION	2-1
	POPULATION	2-1
	FOUR-COUNTY ECONOMY	2-1
	Future Growth	2-3
	Historical Patterns	2-6
	Ethnic Distribution of the Workforce	
	GEOGRAPHIC VARIATION IN SOCIOECONOMIC	
	TRENDS	2-8
3	BENEFITS AND COSTS	
	INTRODUCTION	3-1
	BENEFITS	3-1
	Quantified Benefits	3-1
	Health Benefit	3-2
	Agricultural Benefit	3-9
	Visibility Aesthetic Benefit	3-10
	Material Benefit	3-11
	Material BenefitTraffic Congestion Relief Benefit	3-12
	Unquantified Benefits	3-14
	Health Benefit	3-14
	Agricultural Benefit	3-14
	Material Benefit	3-14
	Material Benefit Traffic Congestion Relief Benefit COSTS	3-15
	COSTS	3-15
	Quantifiable Measures	3-15
	Costs by County	3-19
	Unquantifiable Measures	3-19
	SUMMARY	3-20
4	EMPLOYMENT IMPACTS	
4	INTRODUCTION	4-1

	JOB IMPACTS FROM QUANTIFIED MEASURES ANI)
	BENEFITS	4-1
	Job Impacts by Industry	4-3
	Small Business Effects	
	SUMMARY	4-0
5	IMPACTS ON ETHNIC AND ECONOMIC GROUPS AND	
	COMMUNITIES	<i>5</i> 1
	INTRODUCTION CLEAN AIR BENEFITS BY SUB REGION	3-1 5 1
	COSTS RV SUR DECION	3-1 5 /
	IOR IMPACTS RY SUB-REGION	5-4 5-5
	COSTS BY SUB-REGIONJOB IMPACTS BY SUB-REGIONJOB IMPACTS BY RACE AND ETHNICITY	5-6
	JOB IMPACTS ON HIGH- VERSUS LOW-PAYING JO	BS . 5-8
	IMPACTS ON DISPOSABLE INCOME	5-8
	IMPACTS ON PRICE INDEX BY INCOME	5-9
	SUMMARY	5-10
6	IMPACTS ON COMPETITIVENESS	
6		6.1
	INTRODUCTION REGION'S SHARE OF U.S. JOBS	6-1
	COST OF PRODUCTION AND PRICES	6-2
	IMPORTS AND EXPORTS	6-4
	SUMMARY	6-5
_		
7	ASSESSMENT OF CEQA ALTERNATIVES	7 1
	INTRODUCTION	7-1
	CEQA ALTERNATIVE 2—VOC/NOX COMBINED	7 1
	ALTERNATIVEPOLICY OPTIONS	/-1 7 1
	Policy Ontion 1	7 1
	Policy Option 2	7-1 7-2
	Policy Option 3	7-2
	Policy Option 3COMPARISON OF SOCIOECONOMIC IMPACTS	7-3
	SUMMARY	7-4
0		
8	RECENT REFINEMENTS, UNCERTAINTY, AND FUTURE	
	ACTIONS INTRODUCTION	Q 1
	RECENT ENHANCEMENTS	8-1 8-1
	Benefits of Clean Air	8-1
	Cost of Clean Air	8-1
	Distributional Impacts	8-2
	Competitiveness	8-2
	UNCERTAÎNTY AND CAVEATS	8-2
	Data	8-3
	Data Air Quality Models	8-4
	REMI ModelFUTURE ENHANCEMENTS	8-4
	FUTURE ENHANCEMENTS	8-5
APPENDIC	CES	
A		
A	ASSESSMENT METHODOLOGY INTRODUCTION	Λ 1
		A-1

	COSTS	A-1
	Quantifiable Control Costs	A-1
	Projected Control Costs BENEFITS	A-1
	BENEFITS	A-3
	Quantifiable Benefits	A-3
	Health	A-3
	Visibility	A-4
	Agriculture	A - 4
	Materials	A - 5
	Traffic Congestion Relief	71 3 A-5
	Unquantifiable Renefits	Λ-3 Δ-6
	Unquantifiable BenefitsOTHER SOCIOECONOMIC IMPACTS	Α-0 Δ-6
	REMI Model	A-0
	Input to DEMI	A-0
	Input to REMI Output from REMI	Α- / Λ Q
	Output Holli KEWII	A-o
В	THE REMI MODEL	
D	I DE KEMI MODEL INTRODITOTION	D 1
	INTRODUCTIONFRAMEWORK OF THE REMI MODEL	D-1
		D-1
	ECONOMIC GEOGRAPHY LINKAGE	B-2
	ASSUMPTIONS OF THE REMI MODEL	B-3
	Overall	B-3
	Production	B-4
	Population and LaborVERIFICATION OF THE MODEL	B-5
	VERIFICATION OF THE MODEL	<u>B</u> -5
	ENHANCEMENTS TO THE MODEL	B-5
С	ADJUSTMENT OF THE REMI CONTROL FORECAST	
C	ADJUSTMENT OF THE REMICCONTROL FORECAST	
D	GLOSSARY	
_		
REFERENC	ES	

LIST OF TABLES

Table 2-1: Ethnic Composition of the Four-County Workforce by Major Sector	2-8
Table 2-2: Comparison of Socioeconomic Characteristics of Sub-areas 1990 & 2000	
Table 3-1: Quantifiable Benefits of Draft Final 2007 AQMP (millions of 2000 dollars)	3-2
Table 3-2: Thresholds for Ozone Analysis	3-7
Table 3-3: Changes in Number of Symptoms for Future Years	
Table 3-4: PM _{2.5} Premature Deaths by Adult Mortality Function in 2020	3-8
Table 3-5: Quantifiable Health Benefits (millions of 2000 dollars)	3-9
Table 3-6: Cash Value of Increased Crop Yields (millions of 2000 dollars)	3-10
Table 3-7: Visibility Aesthetic Benefit by County (millions of 2000 dollars)	3-11
Table 3-8: Material Benefit by County (millions of 2000 dollars)	
Table 3-9: Reduced Vehicle Operating and Maintenance Costs by Type of Vehicle	3-13
Table 3-10: Savings from Reduced Travel Time by Trip Type (millions of 2000 dollars)	
Table 3-11: Average Annual Control Cost by Industry and % of Industry Output	3-17
Table 3-12: Average Annual Control Cost by County (millions of 2000 dollars)	3-19
Table 3-13: Cost Effectiveness (2000\$/ton) by Measure Type	3-19
Table 3-14: Total Costs and Benefits of the Draft Final Plan (millions of 2000 dollars)	3-20
Table 4-1: Job Impacts of Quantified Clean Air Benefits and Measures	4-2
Table 4-2: Employment Impacts by Industry for Clean Air Benefits	4-4
Table 4-3: Employment Impacts by Industry for Quantified Measures	4-5
Table 5-1: Average Annual Benefits (2007-2025) by Sub-region	5-2
Table 5-2: Determining Factors for Aesthetic Visibility Benefit by Sub-region	5-3
Table 5-3: Cost Share by Jurisdiction by Sub-region for Quantified Measures	
Table 5-4: Job Impacts by Sub-region for Quantified Benefits and Quantified Measures	5-6
Table 5-5: Avg. Ann, Job Impacts by Ethnicity by Industry for Quantified Benefits	5-7
Table 5-6: Avg. Ann. Job Impacts by Ethnicity by Industry for Quantified Benefits	5-7
Table 5-7: Employment Impacts by Wage Group for Quantified Benefits & Measures	
Table 5-8: Impacts on Price of Consumption Goods for Quantified Benefits & Measures	5-9
Table 6-1: Impacts on Region Share of U.S. Jobs for Quantified Benefits& Measures	6-2
Table 6-2: Impacts on Cost of Prod. Relative to U.S. for Quantified Benefits & Measures	
Table 6-3: Impacts on Deliv. Price Relative to U.S. for Quantified Benefits & Measures	6-4
Table 6-4: Impacts on Imports and Exports for Quantified Benefits and Measures	6-5
Table 7-1: Measures With Accelerated Implementation Dates in Policy Option 2	
Table 7-2: Average Annual Impacts of AQMD Policy Options & CEQA Alternatives	7-3
Table 7-3: Average Annual Quantified Benefits by Category by Alternative	

LIST OF FIGURES

Figure 1-1: Evolution of Socioeconomic Analysis	1-4
Figure 1-2: Assessment Tool Kit	1-6
Figure 1-3: AQMP Socioeconomic Analysis	1-7
Figure 1-4: Use of the REMI Model	1-9
Figure 2-1: Population by Race and Ethnicity	2-2
Figure 2-2: Projected Employment Growth in the Four-County Area	2-3
Figure 2-3: Projected Employment by Sector in the Four-County Economy	2-5
Figure 2-4: Historical Employment by County	2-6
Figure 2-5: Historical Employment by Industry	2-7
Figure 2-6: 1990 Ethnic Distribution of Population	2-10
Figure 2-7: 2000 Ethnic Distribution of Population	2-11
Figure 3-1: Effects of Smog	3-2
Figure 3-2: Health Effects of Criteria Pollutants	3-3
Figure 3-3: Future PM _{2.5} Concentration Changes	3-4
Figure 3-4: Future Ozone Concentration Changes	3-6
Figure 3-5: Point Source Location in 2002 Emission Inventory	3-16
Figure 3-6: Control Cost by Year	3-17
Figure 4-1: Job Impacts of Quantified Clean Air Benefits and Measures	4-2